



WASHINGTON STATE DEPARTMENT OF ECOLOGY

September 2012

CONDITIONAL USE LEVEL DESIGNATION FOR BASIC TREATMENT and PILOT USE LEVEL DESIGNATION FOR ENHANCED TREATMENT

For the

MWS-Linear Modular Wetland

Ecology's Decision:

Based on MWS-Linear's application submissions, Ecology hereby issues the following use level designation:

1. Pilot use level designation (PULD) for the MWS-Linear Modular Wetland Stormwater Treatment System for Enhanced treatment
 - Sized at a hydraulic loading rate of 1 gallon per minute (gpm) per square foot (sq ft) of surface area.
2. Conditional use level designation (CULD) for the MWS-Linear Modular Wetland Stormwater Treatment System for Basic treatment
 - Sized at a hydraulic loading rate of 1 gallon per minute (gpm) per square foot (sq ft) of surface area.

The use level designation expires on June 30, 2014 unless extended by Ecology, and is subject to the conditions specified below.

Ecology's Conditions of Use:

Applicants shall design, install, and maintain the MWS - Linear Modular Wetland Stormwater Treatment System units to comply with these conditions:

1. Engineers must design, assemble, install, operate, and maintain the MWS – Linear Modular Wetland Stormwater Treatment System units, in accordance with Bio Clean Environment Services applicable manuals and documents and the Ecology Decision.

2. Ecology approved monitoring for the MWS - Linear Modular Wetland Stormwater Treatment System units for Basic and Enhanced treatment at the hydraulic loading rate listed above. Designers shall calculate the water quality design flow rates using the following procedures:
 - Western Washington: For treatment installed upstream of detention or retention, the water quality design flow rate is the peak 15-minute flow rate as calculated using the latest version of the Western Washington Hydrology Model or other Ecology-approved continuous runoff model.
 - Eastern Washington: For treatment installed upstream of detention or retention, the water quality design flow rate is the peak 15-minute flow rate as calculated using one of the three methods described in Chapter 2.2.5 of the Stormwater Management Manual for Eastern Washington (SWMMEW) or local manual.
 - Entire State: For treatment installed downstream of detention, the water quality design flow rate is the full 2-year release rate of the detention facility.
3. Bio Clean Environment Services commits to submitting a QAPP for BER review and Ecology approval by January 31, 2012 that meets the TAPE requirements for attaining a GULD for basic and enhanced treatment for the MWS - Linear Modular Wetland unit. Additional QAPPs must be reviewed and approved by the BER and Ecology for each field site in Washington State. The sites chosen (maximum of five for the PULD and ten for the CULD) should be reflective of the product's treatment intent.
4. Local jurisdictions must file a "Pilot Level Technologies Notice of Intent" form with the Department of Ecology prior to authorizing The MWS - Linear Modular Wetland Stormwater Treatment System for a pilot use level application.
5. Bio Clean Environment Services shall complete all required testing and submit a TER for BER and Ecology review by September 30, 2013.
6. Bio Clean Environment Services may request Ecology to grant deadline or expiration date extensions, upon showing cause for such extensions.
7. Discharges from the MWS - Linear Modular Wetland Stormwater Treatment System units shall not cause or contribute to water quality standards violations in receiving waters.

Applicant: *Bio Clean Environmental Services, Inc*
Applicant's Address: *PO. Box 869*
Oceanside, CA 92054

Application Documents:

- Original Application for Conditional Use Level Designation, Modular Wetland System, Linear Stormwater Filtration System Modular Wetland Systems, Inc., January 2011
- Quality Assurance Project Plan: Modular Wetland system – Linear Treatment System performance Monitoring Project, draft, January 2011.
- Revised Application for Conditional Use Level Designation, Modular Wetland System, Linear Stormwater Filtration System Modular Wetland Systems, Inc., May 2011

Applicant's Use Level Request:

- Conditional Use Level Designation (CULD) for Basic and Enhanced treatment in accordance with Ecology's 2005 Western Washington Stormwater Manual.

Applicant's Performance Claims:

- The MWS – Linear Modular wetland is capable of removing a minimum of 80-percent of TSS from stormwater with influent concentrations between 100 and 200 mg/l.
- The MWS – Linear Modular wetland is capable of removing a minimum of 50-percent of Total Phosphorus from stormwater with influent concentrations between 0.1 and 0.5 mg/l.
- The MWS – Linear Modular wetland is capable of removing a minimum of 30-percent of dissolved Copper from stormwater with influent concentrations between 0.003 and 0.020 mg/l.
- The MWS – Linear Modular wetland is capable of removing a minimum of 60-percent of dissolved Zinc from stormwater with influent concentrations between 0.02 and 0.30 mg/l.

TAPE Program Recommendations:

The TAPE Program finds that:

- Bio Clean Environment Services should be given the opportunity to demonstrate, through additional laboratory and field-testing, whether the MWS - Linear Modular Wetland Stormwater Treatment System filter system can attain Ecology's Basic and Enhanced treatment goals.

Findings of Fact:

- Capability to remove 99percent of total suspended solids (using Sil-Co-Sil 106) in a quarter-scale model with influent concentrations of 270 mg/L.
- Capability to remove 91percent of total suspended solids (using Sil-Co-Sil 106) in laboratory conditions with influent concentrations of 84.6 mg/L at a flow rate of 3.0 gpm per square foot of media.
- Capability to remove 93-percent of dissolved Copper in a quarter-scale model with influent concentrations of 0.757 mg/L.
- Capability to remove 79-percent of dissolved Copper in laboratory conditions with influent concentrations of 0.567 mg/L at a flow rate of 3.0 gpm per square foot of media.
- Capability to remove 80.5-percent of dissolved Zinc in a quarter-scale model with influent concentrations of 0.95 mg/L at a flow rate of 3.0 gpm per square foot of media.
- Capability to remove 78-percent of dissolved Zinc in laboratory conditions with influent concentrations of 0.75 mg/L at a flow rate of 3.0 gpm per square foot of media.

Issues to be addressed by the Company:

1. The MWS - Linear Modular Wetland Stormwater Treatment System must show that it can reliably attain the minimum percent removal criteria for Basic and Enhanced treatment for runoff found on local highways, parking lots, and other high-use areas at the design-operating rate in accordance with the Ecology TAPE protocols. Bio Clean Environment Services should test a variety of operating rates to establish conservative design rates. Pollutant loading capacities should also be determined to better predict maintenance cycles.
2. The system should be tested under normal operating conditions, such that the settling basin is partially filled with pollutants. Results obtained for "clean" systems may not be representative of typical performance.
3. Calculation of treatment efficiency shall be in accordance with the 2011 Revision of the *Guidance for Evaluating Emerging Stormwater Treatment Technologies: Technology Assessment Protocol – Ecology (TAPE)*.
4. A discussion of treatment efficiency (percent removed) as flow rates change shall be included in the Technical Evaluation Report.
5. Field-testing should be conducted at sites that are indicative of the treatment goals.
6. Testing should be conducted to obtain information about maintenance requirements in order to come up with a maintenance cycle.
7. Loading tests should be conducted on the units to determine maximum treatment life of the system.

Technology Description:

Download at www.biocleanenvironmental.com

Contact Information:

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Ecology web link: <http://www.ecy.wa.gov/programs/wg/stormwater/newtech/index.html>

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Revision History

Date	Revision
June 2011	Original use-level-designation document
September 2012	Revised dates for TER and expiration